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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/502,170	07/21/2004	Toshiaki Takenaka	MAT-8563US	8532
23122	7590	08/07/2006	EXAMINER	
RATNERPRESTIA P O BOX 980 VALLEY FORGE, PA 19482-0980			ARBES, CARL J	
			ART UNIT	PAPER NUMBER
			3729	
DATE MAILED: 08/07/2006				

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	<b>Application No.</b> 10/502,170	<b>Applicant(s)</b> TAKENAKA ET AL.	
	<b>Examiner</b> C. J. Arbes	<b>Art Unit</b> 3729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 11 May 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) 13-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2 and 5-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>herein</u> | 6) <input type="checkbox"/> Other: _____  |

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After further study and consideration it is deemed to be necessary that prosecution continue and that a further is necessary. Applicants' Remarks/Arguments which were filed on or about 11 May 2006 are being held in abeyance.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The Restriction Requirement which was mailed on or about 06 September 2005 was made **FINAL**. In an non-Final Office Action which was mailed on or about 09 February 2006 Applicants were required to cancel all non-elected claims or take other appropriate action. Applicants did neither. Therefore Applicants are again required to cancel all non-elected pending claims i.e. claims 13-16 or take other appropriate action for the reasons provided in said previous Office Action.

Claims 1, 2 and 5-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japanese. Pat No. 09-199829, by Shizuo et al (of Record); hereinafter Shizuo et al.

Shizuo et al teach a method of manufacturing printed wiring board wherein one forms a copper foil and laminates the foil to a prepreg which is impregnated with a thermosetting resin. The thermosetting resin is heated and pressurized at a first temperature below that which the resin hardens. A punching step is then applied which creates via holes and these via holes are filled with electrical conductive powder incorporated into a conductive paint thus giving a conductive paste. The prepreg sheet

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is then heated and pressurized at a temperature which higher than the first temperature. It would have been obvious given the teaching of Shizuo et al to heat and pressurize the prepreg sheet and the metallic foil for a specific time at a first heating temperature which is below the softening temperature of the resin and heating and pressurizing the prepreg sheet and the metallic foil for a length of time at a second temperature higher than the first temperature. One object of the Shizuo et al teaching and an object of the claimed invention is to increase the number of through-holes and reduce the distances between adjacent through-holes i.e. reduce "pitch". As further applied to claim 2 it is seen in Figure 1 of Shizuo et al that the temperature of the resin is continuously raised. It would have been obvious therefore to raise the temperature to a third heating temperature which is higher than the second temperature. As applied to claim 5 it is held to be mere design choice to dispose the metallic foil on both surfaces of the prepreg sheet or place the prepreg sheet is placed on both surfaces of a circuit board followed by placing metallic foil on metallic foil on the outer surfaces inasmuch as no specific problem is addressed nor is there any particular purpose therefore. As applied to claim 7 wherein Applicants recite that the softening point temperature of the thermosetting resin is lower than the softening point temperature of the resin of the prepreg sheet this would follow from phase diagram construction. That is when a solute (here conductive filler) is placed into a solvent (here thermosetting resin) the melting (or softening points) of the mixture will be depressed. That is to say the limitation recited in claim 7 is within the ordinary skill of a PHOSITA. As applied to claims 10 and 11 it would be obvious to use an aromatic polyamide fiber or glass fiber

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as the prepreg inasmuch as this material is old in the art of circuit board materials. As applied to claim 12 the compressibility of the prepreg sheet is an inherent characteristic of the material and therefore the material used would inherently have compressibility of less than 10%. Alternatively the PHOSITA would undue experimentation would choose a material which has a compressibility of less than 10% because that would provide a circuit board which would be strong enduring and resilient.

This is **non-Final Action**.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to C. J. Arbes whose telephone number is 571-272-4563. The examiner can normally be reached on M, T, R and F from 8 to 5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, P. Vo, can be reached on 571-272-4563. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
CARL J. ARBES  
PRIMARY EXAMINER